

WHAT IS CLAIMED IS:

1. A modulating apparatus for optical communication which modulates a carrier by a modulation signal and generates
5 a modulated wave to be supplied to a light emitting diode, wherein modulation is executed to satisfy:

$$f_d > f_1,$$

$$f_u < f_2, \text{ and}$$

$$f_d > f_u/2$$

10 when a lower limit frequency of a use-permitted frequency band is f_1 [Hz], an upper limit frequency of the use-permitted frequency band is f_2 [Hz], a lower limit side band of the modulated wave is f_d [Hz], and an upper limit side band of the modulated wave is f_u [Hz].

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2. A modulating apparatus for optical communication which modulates a carrier by a modulation signal and generates a modulated wave to be supplied to a light emitting diode, wherein modulation is executed to satisfy:

20 $f_d > f_1,$

$$f_u < f_2, \text{ and}$$

$$f_c > 3(1+\alpha) f_{sr}/2$$

when a lower limit frequency of a use-permitted frequency band is f_1 [Hz], an upper limit frequency of the use-permitted frequency
25 band is f_2 [Hz], a carrier frequency is f_c [Hz], a rolloff factor is α , and a symbol rate of the modulation signal is f_{sr} .

3. The modulating apparatus according to claim 1, wherein the modulation is executed according to a modulating
30 system including amplitude modulation.

4. A transmitting apparatus comprising:

a modulating apparatus for optical communication which modulates a carrier by a modulation signal and generates a

modulated wave to be supplied to a light emitting device, wherein modulation is executed to satisfy:

$$f_d > f_1,$$

$$f_u < f_2, \text{ and}$$

5 $f_d > f_u/2$

when a lower limit frequency of a use-permitted frequency band is $f_1[\text{Hz}]$, an upper limit frequency of the use-permitted frequency band is $f_2[\text{Hz}]$, a lower limit side band of the modulated wave is $f_d[\text{Hz}]$, and an upper limit side band of the modulated wave is $f_u[\text{Hz}]$; and

a light transmitting unit having the light emitting device which is driven by the modulated wave generated by the modulating apparatus and outputs a light-modulated wave.

15 5. A transmitting apparatus comprising:

a modulating apparatus for optical communication which modulates a carrier by a modulation signal and generates a modulated wave to be supplied to a light emitting device, wherein modulation is executed to satisfy:

20 $f_d > f_1,$

$$f_u < f_2, \text{ and}$$

$$f_c > 3(1+\alpha) f_{sr}/2$$

when a lower limit frequency of a use-permitted frequency band is $f_1[\text{Hz}]$, an upper limit frequency of the use-permitted frequency band is $f_2[\text{Hz}]$, a carrier frequency is $f_c[\text{Hz}]$, a rolloff factor is α , and a symbol rate of the modulation signal is f_{sr} ; and

25 a light transmitting unit having the light emitting device which is driven by the modulated wave generated by the modulating apparatus and outputs a light-modulated wave.

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6. A computer program product for making a computer function as a modulating apparatus, by executing the computer program, for optical communication which modulates a carrier by a modulation signal and generates a modulated wave to be

supplied to a light emitting device wherein modulation is executed
to satisfy:

$$f_d > f_1,$$

$$f_u < f_2, \text{ and}$$

5 $f_d > f_u/2$

when a lower limit frequency of a use-permitted frequency band
is $f_1[\text{Hz}]$, an upper limit frequency of the use-permitted frequency
band is $f_2[\text{Hz}]$, a lower limit side band of the modulated wave
is $f_d[\text{Hz}]$, and an upper limit side band of the modulated wave
10 is $f_u[\text{Hz}]$.

7. A computer program product for making a computer
function as a modulating apparatus, by executing the computer
program, for optical communication which modulates a carrier
15 by a modulation signal and generates a modulated wave to be
supplied to a light emitting device, wherein modulation is
executed to satisfy:

$$f_d > f_1,$$

$$f_u < f_2, \text{ and}$$

20 $f_c > 3(1+\alpha) f_{sr}/2$

when a lower limit frequency of a use-permitted frequency band
is $f_1[\text{Hz}]$, an upper limit frequency of the use-permitted frequency
band is $f_2[\text{Hz}]$, a carrier frequency is $f_c[\text{Hz}]$, a rolloff factor
is α , and a symbol rate of the modulated signal is f_{sr} .

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